What is Claimed is:

1. A method for performing source separation, comprising:

receiving a composite signal of a plurality of sources, each source characterized by at least one filtered basis function and at least one coefficient;

providing a post-filter signal dictionary that includes a set of filtered basis functions, wherein at least a portion of the filtered basis functions that form part of each source is included in the dictionary; and

estimating the value of the at least one coefficient of each source using the composite signal and the dictionary; and

selectively reconstructing at least one source using the estimated value of the at least one coefficient.

2. The method defined in claim 1 further comprising:

providing a pre-filter signal dictionary that includes a set of basis functions;

providing at least one directional filter; and

generating the post-filter signal dictionary by convolving the at least one directional filter to each basis function in the pre-filter signal dictionary.

3. The method defined in claim 2, wherein the basis functions are selected according to predetermined criteria.

4. The method defined in claim 2, wherein each basis function represents a signal originating substantially directly from a source.

5. The method defined in claim 2, wherein the at least one directional filter characterizes a basis function as if it originated from a source located in a particular location.

6. The method defined in claim 1, wherein each filtered basis function represents a signal originating from a source located in a particular location.

7. The method defined in claim 2, wherein the at least one directional filter is a head-related transfer function.

8. The method defined in claim 1 further comprising using a sensor to receive the composite signal.

9. The method defined in claim 1 further comprising using a plurality of sensors to receive the composite signal.

10. The method defined in claim 1, wherein the step of estimating further comprises:

generating a plurality of solutions for a given one of the coefficients;

determining which one of said plurality of solutions corresponds to a most sparse solution; and

assigning the most sparse solution to the given one of the coefficients.

11. The method defined in claim 1, wherein the step of estimating comprises:

generating a plurality of solutions for a given one of the coefficients;

determining which one of said plurality of solutions mostly closely satisfies predetermined criteria, said predetermined criteria including noise criteria; and

assigning the solution that most closely satisfied said predetermined criteria to the given one of the coefficients.

12. The method defined in claim 1, wherein the step of selectively reconstructing comprises using the estimated value of the at least one coefficient and the post-filter signal dictionary.

13. The method defined in claim 1, wherein step of selectively reconstructing comprises using the estimated value of the at least one coefficient and a pre-filter signal dictionary used to generate the post-filter signal dictionary.

14. The method defined in claim 1, wherein the composite signal is a signal selected from the group consisting of an acoustic signal, an electromagnetic signal, a radio signal, an ultrasonic signal, a light signal, or an electrical signal.

15. A system for performing source separation, comprising:

a sensor for receiving a composite signal of a plurality of sources, each source characterized by at least one filtered basis function and at least one coefficient; and

a programmable processor electrically coupled to the sensor, the processor is operative to access a post-filter signal dictionary that includes a set of filtered basis functions, wherein at least a portion of the filtered basis functions that form part of each source is included in the dictionary; the processor is operative to estimate the value of the at least one coefficient of each source using the composite signal and the dictionary, and the processor is operative to selectively reconstruct at least one source using the estimated value of the at least one coefficient.

16. The system defined in claim 15 further comprising:

a storage device coupled to the processor, the storage device having stored therein a pre-filter signal dictionary that includes a set of basis functions and at least one directional filter.

17. The system defined in claim 16 wherein the processor is operative to generate the post-filter signal dictionary by convolving the at least one directional filter to each basis function in the pre-filter signal dictionary.

18. The system defined in claim 16, wherein the basis functions are selected to satisfy predetermined criteria.

19. The system defined in claim 16, wherein each basis function represents a signal originating substantially directly from a source.

20. The system defined in claim 16, wherein the at least one directional filter characterizes a basis function as if it originated from a source located in a particular location.

21. The system defined in claim 15, wherein each filtered basis function represents a signal originating from a source located in a particular location.

22. The system defined in claim 16, wherein the at least one directional filter is a head-related transfer function.

23. The system defined in claim 15 further comprising at least a second sensor that is electrically coupled to the processor and that receives the composite signal.

24. The system defined in claim 15, wherein the processor is operative to:

generate a plurality of solutions for a given one of the coefficients;

determine which one of said plurality of solutions corresponds to a most sparse solution; and

assign the most sparse solution to the given one of the coefficients.

25. The system defined in claim 15, wherein the processor is operative to selectively reconstruct at least one source using the estimated value of the least one coefficient and the post-filter signal dictionary.

26. The system defined in claim 15, wherein the processor is operative to selectively reconstruct at least one source using the estimated value of the at least one coefficient and a pre-filter signal dictionary used to generate the post-filter signal dictionary.

27. The system defined in claim 15, wherein the composite signal is a signal selected from the group consisting of an acoustic signal, an electromagnetic signal, a radio signal, an ultrasonic signal, a light signal, or an electrical signal.

28. A method for performing source separation, comprising:

generating a signal dictionary through application of at least one directional filter;

receiving a mixture of a plurality of sources, including desired sources and undesired sources; and

separating said plurality of sources using elements of said signal dictionary and said mixture as variables in a set of mathematical equations that estimate the value of unknown coefficients corresponding to each of said sources.

29. The method defined in claim 28 further comprising:

reconstructing said desired sources using the estimated value of said coefficients.

30. The method defined in claim 29, wherein said reconstructing comprises using the estimated value of said coefficients and said signal dictionary to reconstruct said desired sources.

31. The method defined in claim 28, wherein said generating comprises:

providing a pre-filter signal dictionary having a set of basis functions; and

applying said at least one directional filter to said set of basis functions to generate said signal dictionary, wherein said elements of said signal dictionary are filtered basis functions.

32. The method defined in claim 31, wherein said reconstructing comprises using the estimated value of said coefficients and said pre-filter signal dictionary to reconstruct said desired sources.

33. The method defined in claim 31, wherein said at least one directional filter modifies the properties of said basis functions to approximate how said basis functions are received based on a particular location in which said basis functions originate.

34. The method defined in claim 28, wherein said receiving comprises using one sensor.

35. The method defined in claim 28, wherein said receiving comprises using at least two sensors.

36. The method defined in claim 28, wherein said mathematical equations apply an L1 norm optimization condition to estimate the value of said coefficients.

37. The method defined in claim 28, wherein said at least one directional filter is a head-related transfer function.

38. The method defined in claim 28, wherein said undesired sources comprise noise.

39. A system for performing source separation, comprising:

a sensor for receiving a mixture of a plurality of sources, including desired sources and undesired sources; and

processing circuitry coupled to said sensor and operative to:

generate a signal dictionary through application of at least one directional filter; and

separate said plurality of sources using elements of said signal dictionary and said mixture as variables in a set of mathematical equations that estimate the value of unknown coefficients corresponding to each of said sources.

40. The system defined in claim 39, wherein said processing circuitry is operative to:

reconstruct said desired sources using the estimated value of said coefficients.

41. The system defined in claim 39, wherein said processing circuitry is operative to reconstruct said desired sources using the estimated value of said coefficients and said signal dictionary.

42. The system defined in claim 39 further comprising:

a storage device coupled to said processing circuitry, said storage device comprising a pre-filter signal dictionary having a set of basis functions; and

wherein said processing circuitry is operative to apply said at least one directional filter to said set of basis functions to generate said signal dictionary, wherein said elements of said signal dictionary are filtered basis functions.

43. The system defined in claim 42, wherein said processing circuitry is operative to reconstruct said desired sources using the estimated value of said coefficients and said pre-filter signal dictionary.

44. The system defined in claim 42, wherein said at least one directional filter modifies the properties of said basis functions to approximate how said basis functions are received based on a particular location in which said basis functions originate.

45. The system defined in claim 39, wherein said sensor is a first sensor, said system further

comprising at least a second sensor to receive said mixture.

46. The system defined in claim 39, wherein said mathematical equations apply an L1 norm optimization condition to estimate the value of said coefficients.

47. The system defined in claim 39, wherein said at least one directional filter is a head-related transfer function.

48. The system defined in claim 39, wherein said undesired sources comprise noise.

49. A method for generating a signal dictionary, comprising:

providing a pre-filter signal dictionary having a plurality of basis functions;

providing at least one directional filter; and

generating a post-filter signal dictionary having a plurality of filtered basis function that are created by applying said at least one directional filter to each basis function in said pre-filter signal dictionary.

50. The method defined in claim 49, wherein said at least one directional filter is a head-related transfer function.

51. A system comprising processing equipment for generating a signal dictionary, said processing equipment configured to:

store in a storage device at least one directional filter and a pre-filter signal dictionary having a plurality of basis functions; and

generate a post-filter signal dictionary having a plurality of filtered basis function that are created by applying said at least one directional filter to each basis function in said pre-filter signal dictionary.

52. The system defined in claim 51, wherein said at least one directional filter is a head-related transfer function.

53. The system defined in claim 51, wherein said processing equipment is operative to use said post-filter signal dictionary to perform source separation.